M.A.R.S. Making Aerospace Real for Students

News
AEROSPACE EDUCATION
Inspiring Students to Excel

Nov. - Dec. 2004

IN THIS ISSUE

Topics of Interest

Aerospace Education News is the official bi-monthly publication of the Civil Air Patrol and is produced by the Leadership Development and Membership Services Directorate, CAP National Headquarters, Maxwell AFB, Alabama.

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If you have news, events, or ideas we might consider for the newsletter, please submit them electronically to jstone@cap.gov.

ESTES-COX and CAP Offer Teacher Scholarships

In February of this year, Estes-Cox Corporation became a Corporate Partner of the Civil Air Patrol. Estes-Cox manufactures Estes model rockets and Cox radio-controlled airplanes. Estes rockets are used to teach science, mathematics, technology and many other subjects in over 30,000 schools and youth groups across the United States. Estes and CAP have worked together for many years on aerospace education and cadet programs using Estes model rockets and Cox airplanes. Because of this, Estes-Cox has designated their financial support to be used to create the Estes-CAP Teacher Scholarship program.

Now, more than ever before, teachers need quality, meaningful aerospace education activities to motivate students, which in turn will help them implement the *No Child Left Behind Act*. The Estes-CAP Teacher Scholarship program will give teachers a one-year membership in CAP's popular Aerospace Education Membership (AEM) Program. Just one of the many components of this program is the opportunity to participate in the Aerospace Education Excellence Award Program that gives teachers appropriate aerospace hands-on activities for their students.

Estes-Cox, the U.S. Department of Education and CAP have formed a partnership to sponsor 400 teachers in 16 areas across the country. Because of the Estes-CAP Teacher Scholarships, these 400 teachers from inner city, disadvantaged schools will become members of the Aerospace Education Membership Program. The scholarships will provide the AEM program to 25 teachers in each of the following eight cities this fall: New York, Milwaukee, Los Angeles, Washington, D.C., Houston, Denver, Cleveland and Miami. With the assistance of the U.S. Department of Education, eight more cities will be chosen in January to receive 200 Estes-CAP Teacher Scholarships.

If you know of a city or a teacher that fits the criteria, please contact agrimm@centurims.com or kbaucum@cap.gov.

QUEST FOR SPACE Magazine Features CAP Aerospace Education

The following is an excerpt from an article written by Melanie LeMay (Public Relations Specialist for CAP Headquarters) that appeared in the publication, *Quest for Space.*

"According to a recent report issued by the Aerospace Industries Association, America is facing a 'major workforce crisis in its aerospace industry,' which makes the promotion of math and science

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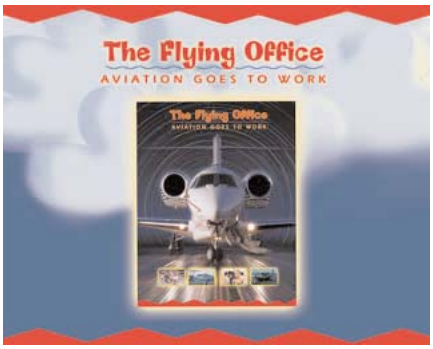
CAP PARTNERS IN THE NEWS:
National Business Aviation Association (NBAA) Sponsors AvKids Program

Since NBAA's inception of the AvKids program in 1999, over 55,000 *AvKids Teachers Guides* have been distributed to schools around the United States and in Canada. The AvKids program teaches students in grades 2-5 about the benefits of business aviation and its exciting career opportunities. The guide provides teachers and other educators with a variety of hands-on projects and activities that engage the students in math, science, geography and social studies.

The *AvKids Teachers Guides* and the avkids.com web site have been the mainstay of the program. However, in 2003, the AvKids program released a book titled *The Flying Office: Aviation Goes to Work.* Response to the book has been strong since this book supplements not only the Teachers Guides, but also the material on the AvKids.com website.

The AvKids program has also engaged in educating students within the Washington D.C. area by various staff members of NBAA visiting schools and arranging for AvKids



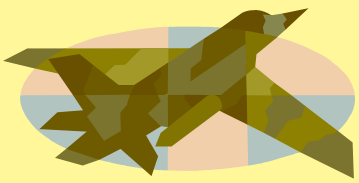
events at local airports. But such special events haven't been limited to just NBAA staff. NBAA members have also held similar events or activities in their local communities.

For more information, go to AvKids web site at www.avkids.com.

FOR YOUR INFORMATION....

Air Force Junior ROTC Adding Units

AFJROTC will add 201 additional units by academic year 2007, growing from 744 to 945 units. This growth has created a need for 402 additional instructors and AFJROTC is looking for qualified retired Air Force members to take on rewarding teaching roles as AFJROTC instructors in high school classrooms across America and overseas. People from all career fields are needed. Air Force officers or enlisted members who retired from active duty within the past five years or less and who have at least 20 years of service may apply. Active duty members may apply when they are within six months of their retirement date. Interested applicants go online at: http://www.afoats.af.mil/AFJROTC/default.htm for vacancy lists and an application or call 1-866-235-7682 extension 35275/35300.



"Create An Air Show Poster!" 2005 International Aviation Art Contest

The International Aviation Art Contest is sponsored by the National Aeronautic Association, National Association of State Aviation Officials and Federal Aviation Administration, in cooperation with the Federation Aeronautics International (FAI) to motivate and encourage young people of FAI-member nations to become more familiar with and participate in aeronautics, engineering and science. For more information contact your local state aeronautics/aviation bureau or go online at http://www.faa.gov/education/art-contest/00art.htm

Which one of the following rocket pioneers helped develop the V-2 ballistic missile for Germany during World War II?

a. Werner von Braun
b. Robert Goddard
c. Hermann Oberth
d. Konstantin Tsiolkovsky

IN THE AEM SPOTLIGHT...ELLEN HOLMES

Inspiration to motivate children in aerospace.....Ellen Holmes received hers through a NASA Educational Workshop (N.E.W.) and as an AEM with Civil Air Patrol. Ellen attended N.E.W. at Marshall Space Flight Center in 2001 where she also found out about the CAP Aerospace Education Member Program. As a result of the curriculum materials she received, Ellen developed a very robust aerospace education unit for her fourth graders. For the past two years, Ellen's class has participated in CAP's Aerospace Education Excellence Program (AEX) using the activities provided by the AEX activity books. Her students received their certificates in a school-wide ceremony where they were spotlighted for their achievement. Their pride and enthusiasm were evident to all attending.

Mrs. Holmes' two weeks in Huntsville, Alabama attending the NASA workshop changed the way she approached teaching science. While at Marshall, she discovered that her state was one of only two that did not have a regional NASA Educator Resource Center (ERC). Seeing the benefits of this resource for the students and teachers of her largely rural state, Ellen immediately began to contact legislative and education leaders in her state. She was asked to join the education committee of the Challenger Learning Center of Maine where her first task was to help with the application for a regional ERC. She also helps plan, promote, and present statewide teacher workshops using NASA materials.

Ellen Holmes has also distinguished herself by receiving awards and grants. She won Maine's 2002 Excellence in Education Award and the American

Institute of Aeronautics and Astronautics (AIAA) Educator Achievement Award for 2003. Ellen was chosen to be an Educator Facilitator at Kennedy Space Center for the 2002 N.E.W. program and presented at the International Space Station Educator's Conference last February based on her experiences at Kennedy Space Center. Ellen was also recognized by her state's legislature on two occasions with official proclamations; one cited her dedication to the further development of the teaching profession and the other cited her excellence and high goals in working with students. Ellen has also written and received numerous grants that have allowed her students access to the internet, materials to build rockets, and provided funds for various speakers. Most recently, she secured over $10,000 to bring Starship 2040 to the students of Maine.

In addition to actively working to reshape aerospace education in her own school district, Ellen has become an outspoken supporter of quality math and science education in much larger venues. She serves as Chair of the Education Committee for the Challenger Learning Center of Maine. On a national level, Ellen serves on the AIAA Pre-College Education Committee. One of her roles for this committee is to serve as liasion to the Public Policy Committee where she provides information about education programs to policy makers.

Ellen is a fourth grade teacher in Bangor, Maine. She is married and the mother of two boys, 10-year-old Andrew and 18-year-old David.

Due to Ellen's exciting programs and materials a great number of students now add the words engineer, pilot, designer, astronaut and scientist to their list of aspirations. Ellen states, "As an individual, the N.E.W. program gave me the resources, support, and confidence to broaden not only my horizons and lift my aspirations, but to affect the outlook of students and colleagues in my school, district, and state."

IN THE AEO SPOTLIGHT... Major KELLY WARDLAW

Article courtesy of: Capt. Kathy Curtin, OKWG PAO

Those attending NCASE had the experience of witnessing the exuberance displayed by Kelly Wardlaw when her ticket was drawn as the winner of the trip to the Space Academy for Educators in Huntsville, Alabama.

After four months of waiting, the opportunity to enjoy her door prize arrived July 13-18. The following is a personal account of her experience:

"It was a busy and exciting six days, from teacher workshops to simulations and training there was hardly a minute to spare. Teacher workshops included classes on using hydropology and crystallography to teach science concepts, and incorporating aerospace themes in literature and social sciences. We designed a mission patch, built air and water rockets, and put together a radio telescope to listen to Jupiter. Any spare moments we did manage to find were spent enjoying the exhibits of the US Space and Rocket Center – and buying souvenirs for family and friends.

Perhaps one of the most memorable experiences was having the opportunity to meet and listen to Konrad Dannenburg. For me, it was not so much what he talked about, but the fire and passion with which he talked. From the very birth of the "Space Age" to the first successful launch of a commercial craft into space, he has seen it all.

We had the opportunity to participate in two simulated missions. I was chosen as the Shuttle Commander for our first mission, and was in charge of the *Atlantis* shuttle and crew. For our second mission, I had the opportunity to see the other side of things, serving as the Flight Director in Mission Control. In addition to the simulated missions, we experienced three different Astronaut Simulators: the Manned Maneuvering Unit (MMU), the 1/6th Gravity Trainer, and the Multi-Axis Trainer (MAT).

On our last evening, we traveled over to the Aviation Challenge Camp to experience three different water survival activities. The Helio Dunker was a mock-up of a helicopter body with seats for a pilot, co-pilot, and four crew members. The Dunker is lowered into the water, and the crew escapes through the egress door. After escaping, we swam out to a 20 person life raft and waited while one by one, we swam up to the helicopter rescue. Water sprayed down on top of us, simulating the helicopter prop wash, and we pulled ourselves into a basket to be lifted up to the shore, through a helicopter door. The final activity involved putting on a parachute rig, climbing a 50 foot tower, and rappelling down into the lake.

This was an amazing experience, and I am very grateful to Space Camp and CAP for providing me with this opportunity. I look forward to sharing all I have learned and experienced with my fellow CAP members and educators."

Major Kelly Wardlaw joined the Civil Air Patrol in 1997. During her membership, she has been involved in all three of CAP's Missions, but found her passion in Aerospace Education. She is currently serving as the Internal Aerospace Education Officer for the Oklahoma Wing as well as the Aerospace Education Officer for the Stillwater Composite Squadron.

Under her leadership, the Stillwater Composite Squadron leads the Wing in aerospace. Over 90% of active senior members have received the AEPSM award and its cadets excel in their aerospace tests. The squadron is actively involved in community outreach programs and has averaged five

(Continued on page 5)

AEO Spotlight...

(Continued from page 4)

major community events each year that Maj. Wardlaw has been in this position.

As the Internal Aerospace Education Officer for Oklahoma Wing, Maj. Wardlaw has developed a Wing AE website (http://okaerospace.tripod.com) and will be holding an aerospace workshop for members this fall. She also regularly contributes Aerospace items for inclusion in the Oklahoma Wing newsletter, the *Oklahoma WingSpan.*

Maj. Wardlaw's other accomplishments include: CAP Chuck Yeager AEPSM Award, A. Scott Crossfield Award, 2002 Southwest Region Frank G. Brewer Award, 2003 Oklahoma Wing Outstanding Contribution to Aerospace Education Award, Presenter at the 2004 National Congress on Aviation and Space Education, Grover Loening Award, Paul Garber Award, Master Rating in Cadet Programs, and four Commander's Commendations,

She is currently pursuing a Ph.D. in Education, with an emphasis in Aerospace Education at Oklahoma State University and is a graduate assistant in the NASA Educator Resource Center at the University. Kelly is also a NASA/JPL Solar System Educator.

Maj. Wardlaw is always looking for ways to enhance her knowledge of Aerospace Education, and to share that knowledge with others. Oklahoma Civil Air Patrol is proud its members are able to benefit from her experience through the workshops and training she provides. Keep your eye on this rising star from Oklahoma!

Answer to *Cappy's Quiz*

a. Werner von Braun

AEO/AEM NEWS AND VIEWS

Aerospace Education Foundation (AEF) Grants Feedback

We want to take this opportunity to thank all of the recipients of Educator and CAP Unit grants who provided feedback on how the AEF grant money was spent. We passed your feedback forms and pictures on to AEF, and they were most appreciative of your comments and thanks. It means a great deal to them to hear the wonderful ways you are using their grants to promote aerospace education to CAP members and to America's classrooms. We, in CAP, believe it is the least we can do to show our appreciation for their generosity.

If you received a $250 grant from AEF and haven't provided the feedback, it isn't too late. Please take a moment and fill out the form that was sent with your letter of congratulations on receiving the grant. If you can't find the form it is also available on the CAP/AE website. Download the form and send to us. This small action of thanks can have a major impact on the availability of continued grants.

Aerospace Education Foundation (AEF) Unit Grant Cycle

As most of you know, AEF is a wonderful partner to CAP, and they continue to provide outstanding support to our aerospace education mission. AEF has provided over $110,000 in grants to help fund our aerospace programs. These grants must be used for aerospace-related activities and cannot be used for flying instruction, honor guard, color guard or buying uniforms. A grant request cannot exceed $250.

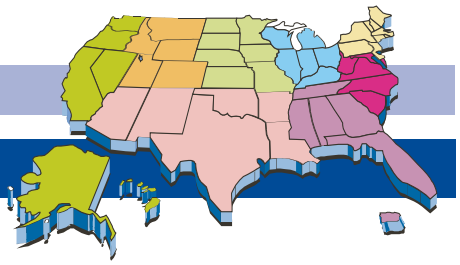
Our next cycle is for CAP Unit grants. The deadline for these grants is December 31, 2004. Applications can be found on our website at ***http://level2.cap.gov/documents/u_061604142106.doc*** Download the form, complete it and send it to us.

Shining Moments for CAP Cadets and Seniors

NC Wing Apex Squadron "Night Raptors" Wins 1st Place in the EAA Wild Blue Wonders Competition

Receiving Brewer Awards at National Board 2004 wereC/1Lt Elizabeth M. Dumont (top left) and Maj John J. DiGiantomasso (bottom center)

REGION TO REGION



NORTHEAST REGION

December 7-8

Professional Development Workshop entitled "Return to the Moon" will be held at The McAuliffe/ Challenger Center at Framingham State College in Framingham, MA. For more information, log on to this website : ***http://www.christa.org/main_page.htm*** or to register call the McAuliffe Center at 508-626-4050.

December 11

The Christmas in the Air celebration (including free Young Eagle flights with prior registration) will be held at the Reading Regional Airport in Reading, PA. For kids of all ages. Call Terry Sroka at 610-372-4666 for more information.

MIDDLE EAST REGION

December 2-4

The Eastern Area Convention of the National Science Teachers Association will be held in Richmond, VA. For more information, go to **http://www.nsta.org/conventions.**

GREAT LAKES REGION

November 11

From 5-8 pm, the Division for Planetary Sciences of the American Astronomical Society will hold a teacher workshop in Louisville, KY. For more information, go to **http://cpl.louisville.edu/DPS/dps_educators.php.**

SOUTHEAST REGION

November 6-7

The Light Aircraft Flyers Association (LAFA) will hold its annual Air Fair at Homestead General Aviation Airport in Homestead, FL. For more information, go to **http://www.lafa.com.**

November 13

"A Flight With Eagles" - 365th Fighter Group "Hell Hawks" Symposium will be held at the Historical Airpower Facility in Peachtree City, GA from 2pm-5pm. For ticket information, call 678-364-1110. To see flyer, go to **http://www.dixiewing.org/hellhawks/hell_hawks_flyer.pdf.**

November 18 -19

The Alabama Education Association, in conjunction with the Wiregrass Math and Science Consortium and Troy University at Dothan, is pleased to announce the Alabama Aerospace Celebration Liftoff on November 18, 2004, in Ozark and the celebration's Teacher Takeoff on November 19, 2004, at Troy University in Dothan, AL. Go to **http://www.aata.net/** as information becomes available.

NORTH CENTRAL REGION

November 3-4

The annual Iowa Aviation Conference will be held at the University Park Holiday Inn West, Des Moines, Iowa. For additional information, go to **http://www.iowaairports.org/conference/index.htm** or call Michele at 515-239-1691.

November 11-14

"2004 SpaceTech Experience" is open to all youth ages 11-19 years of age. This experience will be held in Hutchinson, Kansas. For more information, go to **www.oznet.ksu.edu/spacetech.**

SOUTHWEST REGION

November 27-28

The Socorro Balloon Rally will be held in Socorro, NM. For additional information, contact Mike Shrum at 505-835-2103 or email him at mikeshrum@att.net.

December 3-5

The 24th Red Rock Balloon Rally will be held in Gallup, NM. For more information, call 505-722-9031 or go to **www.redrockballoonrally.com.**

ROCKY MOUNTAIN REGION

January 19-23, 2005

The Association for the Education of Teachers of Science (AETS) will hold its 2005 International Conference at the Antlers Hilton Colorado Springs in Colorado Springs, CO. For more information, go to **http://aets.chem.pitt.edu/.**

PACIFIC REGION

January 9-13, 2005

The 85th American Meteorlogical Society Annual Meeting will be held in San Diego, CA. For details, go to **http://www.ametsoc.org/meet/85annual/index.html.**

CAP Featured... **(Continued from page 1)**

education a vital national interest. The Commission on the Future of the US Aerospace Industry is pressing Congress to create educational incentives for students to pursue aerospace careers and remedy the 'graying' of the industry. Strong national support for aerospace education should be an integral part of any new aerospace agenda.

This focus is nothing new to CAP. Its volunteers promote aerospace education through both its member training programs and through public and private schools. CAP adult and cadet members learn the principles of aerospace as part of their official training. They also recruit teachers in their communities to use CAP educational materials in their classrooms through a special category of CAP membership just for educators. CAP calls its educational program 'MARS' (Making Aerospace Real for Students)."

To read the entire article, go to ***http://level2.cap.gov/index.cfm?nodeID=5176*** and click on item 12.

CURRICULUM CORNER - "Foamie Flyer"

from NBAA's Aviation for Kids Program Activity Guide

Objective:
Students will investigate the principle of thrust.

National Science Standards:

A: Science as Inquiry
- Abilities necessary to do scientific inquiry
- Understanding about scientific inquiry

B: Physical Science
- Position and motion of objects

E: Science and Technology
- Abilities of technological design

Grade Level(s): 2-5

Problem:
Does the amount of thrust affect the Foamie Flyer's flight?

Materials:
Foam paper plates (full size), scissors, masking tape, large paper clips, rubber bands, non-bendable straws, rulers and copies of Student Data Sheet for each student.

Background:
Thrust is the force that moves a plane through the air. Because airplanes fly in a three-dimensional environment, the following terms refer to the various directions an airplane can move:

Pitch - to move the nose of the airplane up or down

Roll - to tilt one wing up and the other wing down

Yaw - to point the nose of the air plane left or right while remaining level with the ground

Bank - to tilt the airplane inward while making a turn

Airplanes, including even the Foamie Flyer, use a variety of "control surfaces" to change the speed and direction in which they fly. These control surfaces include:

Ailerons - movable sections, hinged on the rear edge of the wing near the wingtip, that cause the airplane to roll

Flaps - movable sections, hinged on the rear of the wing, that can be lowered to increase lift and drag during takeoff or landing

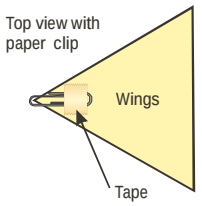
Stabilizer - the vertical stabilizer is the upright portion of the airplane tail, while the horizontal stabilizer is the small wing usually located on the back of the airplane; both control the direction of the plane

Rudders - movable surface usually attached to a vertical stabilizer that guides the airplane in the horizontal plane

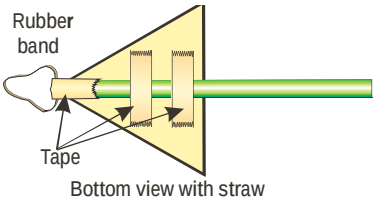
Management:
1. This will take about 45-60 minutes.
2. Students will build their own flyer.
3. This is an outdoor activity.
4. Foamie Flyers must be launched away from other children.
5. When launching the flyers, form groups of 3 or 4 so that all students are not launching at the same time.
6. Save the unused parts of the plate for the extension activities. (Students can use leftover parts to add stabilizers and rudders to their flyers and observe changes in flight).

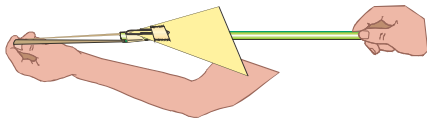
Word Bank:
thrust, lift, gravity, drag, wings, nose, fuselage, ailerons, flaps, pitch, roll, yaw, bank, rudders

Procedure:
1. Give each child the materials.
2. Instruct students to fold back the top three centimeters of the straw and insert the rubber band into the fold.
3. Fold the straw over the rubber band and secure the end with masking tape. This creates the launcher for the flyer.
4. Instruct students to cut a triangle out of the foam plate from the flat inverted side of the plate. A good size to start with is 13 cm x 13 cm x13 cm (equilateral triangle).
5. Tape the paper clip to the top of the foam wings. Then, tape the wings to the top of the launcher so that it extends slightly over the tip.



6. Hook the rubber band around the tip of your thumb and pull back on the opposite end of the flyer. Release the straw and the flyer will fly forward.





7. There should be a designated launch starting line. Call groups forward, one at a time, to launch their flyers. Each child should launch the flyer using two different amounts of thrust. They should first pull the nose of the flyer halfway to their elbow and let it fly. The group should observe the changes in their flyer's flight and distance. These observations can be recorded on the Student Data Sheet.

Student Data Sheet - "Foamie Flyer"

Name_____

1. Did the amount of thrust affect Foamie Flyer's flight?

_____

_____

2. What did you observe when using different amounts of thrust to launch your Foamie Flyer?

_____

_____

3. How differently did the Foamie Flyer fly after changes were made to the ailerons, flaps, sta bilizers or rudder?

_____

_____

4. Draw and label a diagram showing how thrust affected the flight of your flyer.

Order the complete guide at
http://www.avkids.com/guide

CURRICULUM CORNER - NBAA "DRAG RACERS"

Order the complete Aviation for Kids Program Activity Guide at http://www.avkids.com/guide/

Objective:
Students will investigate the force of drag on a moving object.

National Science Standards:
A: Science as Inquiry
- Understanding about scientific inquiry

B: Physical Science
- Properties of objects and materials

Unifying Concepts and Processes
- Evidence, models, and explanation

Grade Level(s): K-4

Problem:
How does a drag-chute affect the speed of student runners?

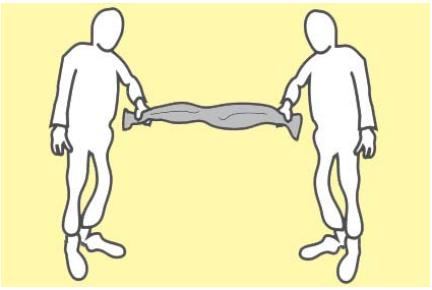
Materials:
garbage bags (large, heavyduty bags work best), tape, stopwatch, and copy of Record Log.

Background Information:
This activity lets students feel the force of drag. Airplanes are designed to be sleek so that drag is reduced, allowing easier movement through the air.

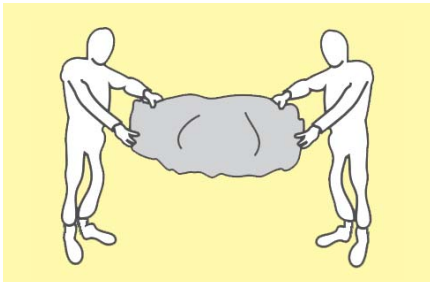
Management:
1. This will be about 45-60 minutes.
2. Students should work in groups of four, taking turns running and timing.
3. Construct the drag-chutes in the classroom. Running will take place outside on a marked 20-30 meter "runway."
4. Garbage bag drag-chutes should be at least one square meter. (This might require taping bags together. If so, make sure seams are solid - (no holes!)

Word Bank:
drag, drag-chute, meter, runway, sleek, aerodynamic, speed, resistance, pull

Procedure:
1. Each group will make their garbage bag drag-chute. To do this, cut along one side and the bottom of the bag. This will make one flat sheet. Make sure it is at least one square meter. If it is not, tape another bag to it.
2. Two students run from the starting line, side by side, holding the drag-chute that is rolled up between them. The timers say "Go," the students run to the finish, and the timers stop the watch. Record the time on the record log.



3. The same two students now repeat the run with the drag-chute unfurled. The timers instruct the students to "Go," then stop the watches at the finish. Record time on the Record Log.



4. The timers should now switch places with the runners. Repeat the procedure.
5. The group then completes the Record Log.

Culminating Activity:
Allow the students to design original drag-chutes, naming their teams. Then conduct a class drag-chute derby!

Drag Racer Record Log

Racers:
(1)_____
(2)_____
(3)_____
(4)_____

	Time without Drag-chute	Time with Drag-chute
Racers 1 and 2		
Racers 3 and 4		

1. How did the drag-chute affect the speed of your race?
_____
_____
_____

2. Why do you think the drag-chute affected your race?
_____
_____
_____

3. Find the difference in speed between your race without the drag-chute and with the drag-chute:
Racers 1 & 2: _____
Racers 3 & 4: _____